

AMENDMENTS TO THE CLAIMS:

The attached replacement sheets of drawings include changes to FIGS. 12 to 14 and replace the original sheet including these figures.

In accordance with the Examiner's suggestions, FIGS. 12 to 14 have been labeled "-- Prior Art--".

Attachments following last page of this Amendment:

Replacement Sheets (2 pages)

REMARKS

This application has been carefully reviewed in light of the non-final Office Action dated May 24, 2007. Claim 2 has been cancelled herein, without prejudice or disclaimer of subject matter. Claims 1 and 3 to 20 are in the application, of which claims 1 and 12 are the independent claims. Since claim 1 has been amended to incorporate the substance of cancelled claim 2, no new matter is believed to have been added. Reconsideration and further examination are respectfully requested.

In accordance with the Examiner's suggestion, the Applicants have amended the drawings to comply with the request for correction. While applicants have complied with this request to expedite prosecution, the addition of the "prior art" label should not be construed as an admission that FIGS. 12 to 14 only disclose technical features found in the prior art. Applicants submit that FIGS 12 to 14 may contain features found in the prior art, and also may include features that are novel and non-obvious and therefore not found in the prior art.

Furthermore, the specification has been amended to delete the terms "data X" and "data Y". Withdrawal of the objections to the specification and drawings and further examination are thus respectfully requested.

Claims 2 and 4 to 7 were rejected under 35 U.S.C. § 112, ¶ 2, as allegedly being indefinite for reciting the terms "TW," "data X," and "data Y." As indicated above, claim 2 has been cancelled, without conceding the correctness of this rejection, and claims 4 to 7 have been amended to delete any reference to terms. Accordingly, withdrawal of the § 112, ¶ 2 rejection and further examination are respectfully requested.

Claims 1 to 15 and 17 to 20 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 6,005,538 ("Hoekstra"); and claim 16 was rejected under 35 U.S.C. § 103(a) over Hoekstra in view of U.S. Patent No. 4,968,917 ("Harris"). Claim 2 has been cancelled, without prejudice or disclaimer of subject matter, and without conceding the correctness of the rejection. Additionally, claims 1 and 12 have been amended herein, to further clarify several distinguishing features. As such, withdrawal of the § 102 and § 103 rejections and further examination are requested.

Referring to particular claim language, independent claim 1 recites a driving circuit for a vacuum fluorescent display having a filament, a grid electrode and a segment electrode. The driving circuit includes a filament driving unit for driving the filament, and a grid driving unit for pulse-driving the grid electrode. The driving circuit also includes a segment driving unit for pulse-driving the segment electrode, and a controlling unit for enabling or disabling the filament to be heated with an output of the filament driving unit. The controlling unit disables the filament to be heated with the output of the filament driving unit during an ON period when the ON period is shorter than a predetermined time period, the ON period being a time period during which a voltage able to drive the grid electrode and the segment electrode is applied to both of the grid electrode and the segment electrode.

The applied art is not seen to disclose, teach or to suggest the foregoing features recited by independent claim 1. In particular, Hoekstra is not seen to disclose at least the features that the controlling unit disables the filament to be heated with the output of the filament driving unit during an ON period when the ON period is shorter than a predetermined time period, the ON period being a time period during which a voltage able to drive the grid electrode and the segment electrode is applied to both of the grid electrode and the segment electrode.

Hoekstra discloses vacuum fluorescent display driver and method for driving a vacuum display device includes a segment selecting circuit which selectively applies a potential of a particular polarity to a segment to illuminate that segment and a grid driver circuit which applies a potential of that polarity to the grid in order to illuminate the device. *See* Hoekstra, Abstract. Although the Office Action asserts that FIG. 8, reference *A* of Hoekstra is analogous to the time period TW (the ON period), the Applicants respectfully disagree. *See* Office Action, pg. 4. Specifically, reference *A* of Hoekstra is understood to be the time period during which the filament 26 is heated. *See* Hoekstra, col. 4, ll. 4 to 12; and col. 8, ll. 34 to 36; and FIG. 8.

Accordingly, no relationship is understood to exist between reference *A* and a time period during which the grid 24 and the segments 20a to 20g are turned ON. *See* Hoekstra, col. 3, ll. 50 to 58. Thus, Hoekstra cannot be not seen to disclose at least the feature that the controlling unit disables the filament to be heated with the output of the filament driving unit during an ON period when the ON period is shorter than a predetermined time period, the ON period being a

time period during which a voltage able to drive the grid electrode and the segment electrode is applied to both of the grid electrode and the segment electrode.

Independent claim 12 recites a driving circuit for a vacuum fluorescent display having a filament, a grid electrode and a segment electrode. The driving circuit includes a filament driving unit for driving the filament, and a grid driving unit for pulse-driving the grid electrode. The driving circuit also includes a segment driving unit for pulse-driving the segment electrode, and a controlling unit for enabling or disabling the filament to be heated with an output of the filament driving unit. The controlling unit enables a pulse width and/or a pulse cycle of a pulse driving signal for pulse-driving the filament to be set based on data received from exterior when enabling the filament to be heated with the output of the filament driving unit.

The applied art is also not seen to disclose, teach or to suggest the foregoing features recited by independent claim 12. In particular, Hoekstra is not seen to disclose at least the features that the controlling unit enables a pulse width and/or a pulse cycle of a pulse driving signal for pulse-driving the filament to be set based on data received from exterior when enabling the filament to be heated with the output of the filament driving unit.

The Office Action asserts that the outputs 44 shown of FIG. 5 of Hoekstra are analogous to the data received from an exterior. Again, the Applicants respectfully disagree. In Hoekstra, the outputs 44 are believed to merely be used for driving the segments. *See* Hoekstra, col. 4, ll. 40 to 46. *See* Hoekstra, col. 5, ll. 62 to 67, and col. 6, ll. 38 to 42. Nothing in Hoekstra is seen to describe, however, that a pulse width and/or a pulse cycle of a pulse driving signal for the filament 26 are set based on the outputs. In this regard, Hoekstra cannot be seen to disclose at least the features that the controlling unit enables a pulse width and/or a pulse cycle of a pulse driving signal for pulse-driving the filament to be set based on data received from exterior when enabling the filament to be heated with the output of the filament driving unit.

Accordingly, based on the foregoing amendments and remarks, independent claims 1 and 12 are believed to be allowable over the applied reference.

Harris is not seen to remedy the deficiencies of Hoekstra, nor is Harris seen to teach, disclose or to suggest the features recited by dependent claim 16. For instance, the Office Action alleges that Harris discloses a dual comparator 35 (including comparators 38 and 39) and a microcomputer 40, and further alleges that “[i]t would have been obvious to one of ordinary skill

in the art at the time the invention was made to utilize [the] dual comparator circuit of Harris into [the] vacuum fluorescent display driver of Hoekstra, because it would improve the usability of [the] control circuit and offer finer adjustment the brightness as suggested by Harris." *See* Office Action, pg. 9.

Upon close examination, however, the Applicants note that the comparator 38 compares LR₁ with DIM Select, and the comparator 39 compares LR₂ with DIM Select. *See* Harris, col. 3, ll. 63 to 66. The microcomputer 40 is understood to change the brightness dictated by the display data at the time the output of both comparators 38 and 39 are at a high level. *See* Harris, col. 4, ll. 55 to 65. Since the dual comparator 35 is used for detecting whether the DIM Select is between LR₁ and LR₂, the dual comparator 35 is not seen to detect the timing when the count value becomes equal to the pulse width data, nor the timing when the count value becomes equal to the pulse cycle data.

The other rejected claims in the application are each dependent from the independent claims and are believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define additional aspects of the disclosure, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

No fees are believed to be due at this time. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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/David E. A. Jordan/

David E. A. Jordan
Reg. No. 50,325

Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331